

Advanced Photon Source

PROCEDURE

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APS Design Review

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- Editorial changes
- Redefinition of Technical Review Panels (no longer have standing TRPs at APS)

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APS Design Review

1 INTRODUCTION

APS design reviews assess the adequacy of new or modified designs of facility components and systems in terms of the potential impact they may have on the APS and its operations.

1.1 Purpose

This procedure defines a uniform approach for the APS to review designs.

1.2 Scope

This procedure applies to designs for new projects or modifications to existing APS systems, including mechanical, pressure, cryogenic, electrical, electronic, software, safety and shielding systems.

The same procedure will be applied to designs brought to the APS from external parties, e.g., Partner Users. In this case the review will focus on safety, although recommendations regarding technical issues may be included in the report.

Consistent with Argonne National Laboratory Quality Assurance Program Plan (QAPP), APS management uses a graded approach to determine the appropriate level of formality to be applied to APS design reviews.

Any improvements or modifications to an APS safety system must follow a formal review process.

1.3 References

- [Argonne Laboratory Management System \(LMS\)](#)
- [Argonne National Laboratory Quality Assurance Program Plan](#)
- [APS Conduct of Operations Manual \(APS_1180311\)](#)
- [BSDRSC Charter \(APS_1194904\)](#)
- [SCDR Charter \(APS_1198251\)](#)
- [RSSCDR Charter \(APS_1198246\)](#)

1.4 Definitions

1.4.1 Radiation Safety System (RSS) Component

For the purpose of this procedure a component or system used to provide radiation protection for personnel is considered a *Radiation Safety System (RSS) component*.

1.4.2 Division Director Design Review

A Division Director design review is an evaluation of any new or modified designs of APS components or systems. Division Director design reviews ensure that designs will achieve project technical goals and meet all safety requirements. Consistent with a graded

approach, a Division Director or Designee may charge, for example, a Steering Committee, a standing safety committee, an internal review panel, or an individual to organize or perform a Division Director design review with the appropriate level of formality.

1.4.3 Beamline – Front End Safety Design Review

A Beamline – Front End Safety Design Review is a design review of a beamline or front end system or component that is specifically for safety and not for technical quality. In this case, APS management has agreed to a standing Beamline Safety Design Review Steering Committee (BSDRSC). For APS designed components, a Division Director Design Review will normally have taken place before the design is brought to a Beamline – Front End Safety Design Review.

1.4.4 Steering Committee

A Steering Committee is a committee charged by a Division Director to organize a formal design review. The steering committee appointed by the Division Director performs the review in accordance with the requirements of [section 2.5](#) and the specific charge.

1.4.5 APS Safety Committee for Design Reviews (SCDR)

The SCDR evaluates the designs of new or modified facilities/components to ensure they meet APS and Argonne safety standards.

1.4.6 APS Radiation Safety Shielding Committee for Design Reviews (RSSCDR)

The RSSCDR evaluates the design of radiation shielding systems that are used for personnel protection for all aspects of radiation safety. The committee also provides the APS and the APS User Community with technical advice on radiation safety and shielding.

1.4.7 Technical Review Panel (TRP)

A TRP refers to one or more subject matter experts in a specific technical area such as vacuum system engineering or robotics. Subject matter experts external to the laboratory may be recruited for specific design reviews, as needed.

1.4.8 Project Coordinator

The project coordinator is the individual responsible for executing the project. This may be an engineer, physicist, MCR Chiefs of Operation, group leader, or associate division director. In the case of a beamline safety design review, it is possible that the project coordinator may not be a member of the APS staff.

1.4.9 Integrated Content Management System (ICMS)

The APS on-line document/record management database.

2 RESPONSIBILITIES

The Division responsible for the review will ensure the submitted designs, reviews, and approvals are filed in ICMS.

Responsibilities concerning implementation of design reviews as defined in this procedure are as follows:

2.1 Associate Laboratory Director

The Associate Laboratory Director will:

- approve the design review procedure;
- provide the final approval of the design review process as described in the Argonne QAPP and the APS Conduct of Operations Manual;
- identify projects that require ALD design approval; and
- provide final decisions for projects identified as requiring ALD design approval.

2.2 Division Director

2.2.1 APS Division Directors

All APS Division Directors will:

- approve designs developed within their divisions, except as noted for beamlines, front ends, and projects identified as requiring ALD design approval; and
- provide for oversight evaluations of the design review process.

Division Directors may:

- designate an Associate Division Director, a Group Leader, or an Individual to be responsible for oversight of projects or improvements of a one-time or continuing nature.

The Division Director or Designee will:

- assess the significance and the potential impact of new designs or engineering changes on the APS facility to determine the appropriate level of review, if any;
- identify a Project Coordinator for every project requiring a design review;
- ensure that the formality of the design review is appropriate for the project risk; and
- assure that the design review process is properly conducted and documented in accordance with the Argonne QAPP and the APS Conduct of Operations Manual.

The Division Director or Designee may:

- charge an ad hoc steering committee, or a standing steering committee, to organize formal design reviews, when needed;
- charge an internal review panel or an individual to perform the review in lieu of a steering committee if a less formal review is justified, for example if the design uses conventional technology and has a moderate or low potential consequence to APS operations;
- add individuals to a standing steering committee or review panel based on the potential impact of the design, the need for additional subject matter expertise, or in case of conflict of interest.

2.2.2 Additional Responsibilities of the AES Division Director

In addition to the above responsibilities, the AES Division Director will:

- be responsible for safety and facility operational issues associated with beamline designs by non-APS designers/engineers;
- provide safety oversight of beamlines, including RSS components for beamlines and front ends; and
- approve beamline and front end designs and modifications.

2.3 Associate Division Directors and Group Leaders

Associate Division Directors and Group Leaders are responsible for bringing to the attention of the Division Director any new or significantly expanded projects, in order to agree on the appropriate level of oversight.

2.4 Project Coordinator

The Project Coordinator will:

- ensure that ES&H and QA/QC requirements are addressed by the designs;
- assure that adequate documentation has been developed for the design review;
- submit the design review documents;
- coordinate the presentations to the reviewers; and
- prepare a response to findings and recommendations from the design review.

2.5 Steering Committee

The Steering Committee charged with organizing a formal design review will:

- require a review by the RSSCDR for all RSS components;
- assure that all safety aspects of the project are reviewed;
- make use of the SCDR and other standing Safety Committees and TRPs to perform the reviews or, for limited scope reviews, carry out the review with participation limited to those members required for an adequate review;
- for Division Director design reviews, assure that technical designs meet project objectives;
- assure that the level of the review is commensurate with the complexity of the design;
- advise the Division Director of the need for additional subject matter expertise; and
- combine the outcome of the reviews and reconcile any differences.

The Steering Committee Chair will:

- provide an advisory report to the ALD, Division Directors, Associate Division Directors, and Group Leaders, as appropriate;

- express all concerns from reviews in the form of numbered recommendations, each beginning with an action verb (should the committee feel that further consideration of an issue is needed, “consider” is an appropriate action verb to use);
- identify in the report any recommendations that were not adopted and include the justification; and
- file the Steering Committee report, safety committee and TRP reports, and the reviewed documents in ICMS.

2.6 SCDR

The SCDR will:

- assess the safety aspects of designs in accordance with its charter;
- review the design, where possible, and in other cases solicit input from standing safety committees, TRPs or subject matter experts;
- identify issues that require further technical evaluation to the Steering Committee; and
- provide written reports in a timely manner.

2.7 RSSCDR

As part of its responsibilities to provide APS management and the APS User community with technically competent advice on the safety of radiation shielding systems at the APS, the RSSCDR will:

- evaluate all RSS components as required by steering committees and in accordance with its charter;
- submit written reports of these reviews, with any recommendations, to the requesting steering committee; and
- based upon its design evaluations, as appropriate, advise the Division Directors of recommended changes to existing safety envelopes.

2.8 TRPs

TRPs will:

- review designs when charged by a steering committee;
- ensure the highest technical standards of new designs;
- promote best engineering values;
- ensure technological feasibility of the fabrication;
- ensure the customer input in the design; and
- provide a written report in a timely manner.

2.9 Design Staff

The Design Staff will:

- perform detailed design effort, including design modifications when required;
- provide all back-up material required to substantiate a design and satisfy all design review scrutiny, as well as ESH and QA/QC requirements; and
- participate in design reviews as required.

2.10 Division Quality Assurance Representative (QAR)

QARs participate in design reviews as follows:

- assure that acceptance criteria for quality verification are adequately specified in drawings and specifications;
- recommend improvements or corrections to quality verification criteria; and
- verify completion of agreed upon QA recommendations.

3 DESIGN REVIEW PROCEDURE

3.1 Overview

The design review procedure consists of a series of evaluations to determine the adequacy of a design in meeting its performance and operational specifications.

3.2 Prerequisite Action

For APS design/engineering efforts covered by this procedure, the responsible Division Director will assign a Project Coordinator. For non-APS managed beamline design/engineering efforts, the beamline management will assign a Project Coordinator.

3.3 Design Review Procedure Flow

The design review procedure is shown in [Figure 1](#) as a hierarchically organized information flow from the Project Coordinator, through the Division Director to the review panel or steering committee. The review process steps are:

Step		Task
1	Project Coordinator	Submit request, along with the necessary design documentation, to the appropriate Division Director for review.
2	Division Director or designee	<ol style="list-style-type: none"> 1. Evaluate the design documentation; 2. charge, for example, a steering committee, a standing safety committee, an internal review panel, or an individual to organize or perform the design review with the appropriate level of formality
3	Committee	<ol style="list-style-type: none"> 1. Evaluate the design documentation ; 2. arrange for Project Coordinator presentations, as required; 3. request reviews by the appropriate safety committees and TRPs; and 4. the Committee Chair files the design documentation in ICMS

4	Review panel, Safety Committees and TRPs	<ol style="list-style-type: none"> 1. Review the designs; and 2. report to the requesting Committee or requesting Division director.
5	Committee Chair	<ol style="list-style-type: none"> 1. Integrate the input from committee members, TRPs and safety committees; 2. notify the project coordinator if clarification or additional information is required; 3. notify in writing the project coordinator, the project coordinator's line management, and the requesting Division Director if, during the course of the review, the Committee seeks prompt corrective action; 4. provide an advisory report to the requesting APS ALD, Division Directors, Associate Division Directors, and Group Leaders, as appropriate; and 5. save the review/advisory report in ICMS.
6	Division Director or designee	<ol style="list-style-type: none"> 1. Approve or reject the design; 2. notify the Project Coordinator of the decision; and 3. save a copy of the approval in ICMS.
7	ALD	<ol style="list-style-type: none"> 1. Provide final approval for projects identified as requiring ALD design approval; 2. notify the Division Director(s) of the decision; and 3. save a copy of the approval in ICMS.

3.4 Additional Requirements for Beamline – Front-End Safety Reviews

The external beamline Project Coordinator or APS Project Coordinator for an RSS component design submits the design package to the AES Division Director. The AES Division Director will utilize the BSDRSC to coordinate these reviews.

APS-designed front-end and beamline RSS components will normally have been the subject of a Division Director Review before they are presented to the BSDRSC. The report from the Division Director review will be made available to the BSDRSC.

RSS component designs that are different from existing approved designs or that will be used in a different context will be submitted at the conceptual level to the AES Division Director. The AES Division Director may choose to have the committee review the concept before further design work is done. In any case a final design review of RSS components will also take place prior to installation, unless such a requirement is waived in writing by the AES Division Director or designee.

4 DOCUMENTS/RECORDS CREATED BY THIS PROCEDURE

Design review documents, recommendations, and design changes resulting from the design review process will be kept in the APS ICMS.

Description of Document/Record	Custodian	Storage Location and Medium	Retention Requirement
Submitted Designs	AES for beamline designs and the requesting division for other designs	ICMS	5 years after design approval or until the equipment/facility is removed - whichever is later
Reviews & Approvals	AES for beamline designs and the requesting division for other designs	ICMS	5 years after design approval or until the equipment/facility is removed - whichever is later

5 FEEDBACK AND IMPROVEMENT

If you are using this procedure and have comments or suggested improvements for it, please go to the [APS Policies and Procedures Comment Form](#)^{*} to submit your input to a Procedure Administrator. If you are reviewing this procedure in workflow, your input must be entered in the comment box when you approve or reject the procedure.

Instructions for execution-time modifications to a policy/procedure can be found in the following document: Field Modification of APS Policy/Procedure ([APS 1408152](#)).

^{*} http://centraldocs.aps.anl.gov/comment_form.php

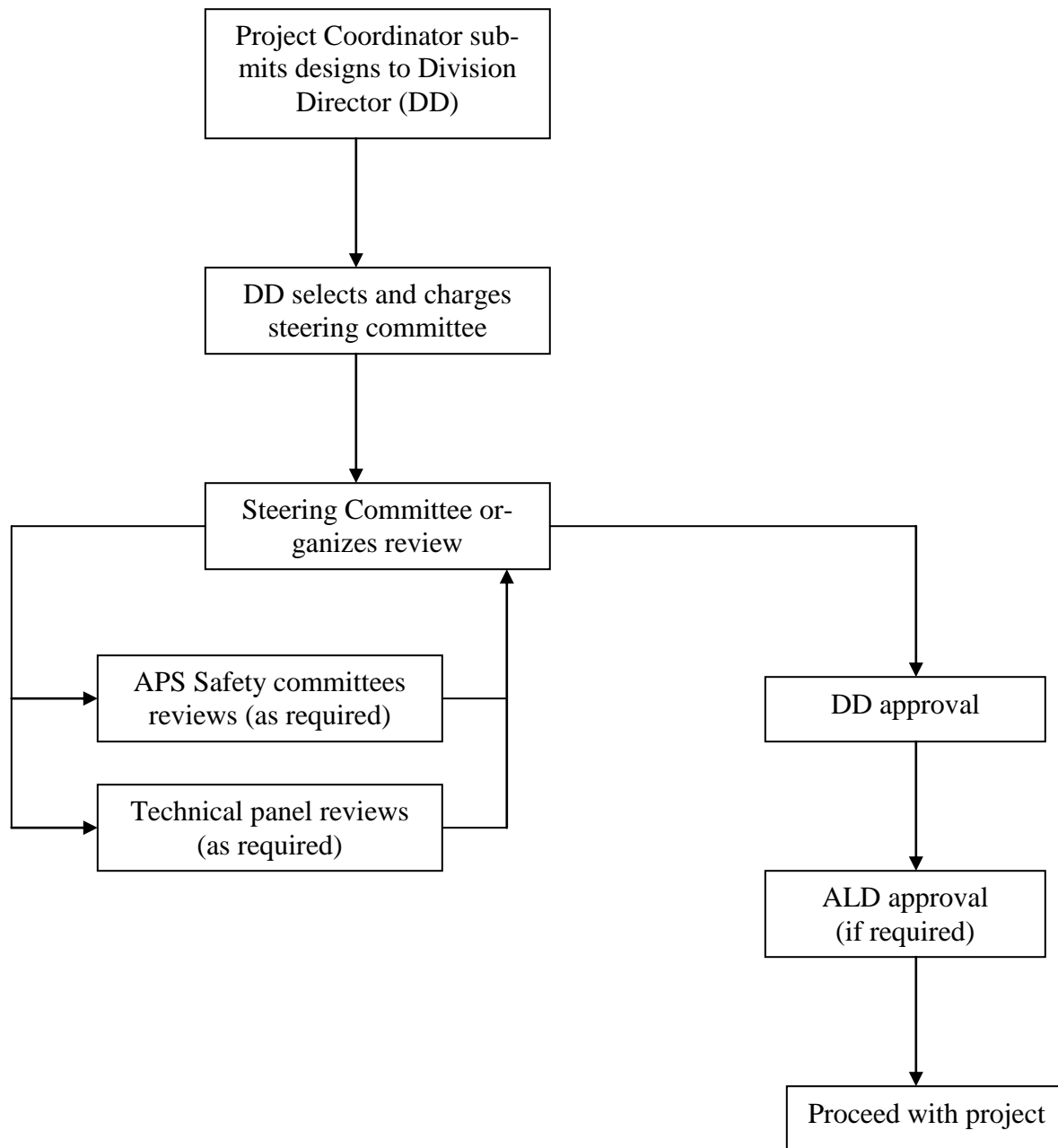


Figure 1. Formal Design Review Procedure Flow